



IPRO 346

Harvesting & Beneficial Use of Condensate from Air Conditioning Systems



Problem

Air conditioning condensate is a wasted resource. Condensate is not safe for drinking, it must be kept separate from other water sources. No system to collect and use condensate is currently implemented on any major scale.

Background

- ❖ Condensation is the process by which water vapor becomes a liquid (condensate).
- ❖ Cooling systems rely on evaporator coils which refrigerant fluid changes from liquid to vapor, cooling the coils in the process. Air blowing past the coils cools off as it goes by, and moisture from the air condenses on the coils. Condensate drains carry away the water, usually to the sewer.
- ❖ Instead of wasting it, the water could be harvested for other uses.
- ❖ The condensate from A/C units produces water of high purity that is undrinkable, because of heavy metals from the coils, but it could be use for other things, like flushing toilets.
- ❖ The biggest obstacle for harvesting A/C condensate are plumbing regulations.
- ❖ A 10,000 sq. foot office building can produce more than 15,000 gallons condensate per year.

- ❖ A typical house can produce roughly 7 gallons a week of condensate. If this is multiplied by 1.7 millions of homes in Chicagoland with central A/C, that would be 11.9 million gallons a week.

Objectives

- ❖ To create public awareness of how much condensate from air conditioning is going down the drain.
- ❖ To advise the public about the uses of condensate.
- ❖ To advocate changes in the plumbing codes that allow the wider use of condensate.

Methodology

Our project was addressed by creating two subgroups, each one was responsible for the development of different areas of the project.

Media Subgroup:

- ❖ Focused on developing and maintaining Facebook, and Twitter accounts.
- ❖ The group also contacted public officials to set meetings with them.

Prototyping Subgroup:

- ❖ Focused on the development of a prototype and the actual installation of a pilot system on IIT.

Results

- ❖ A Facebook and Twitter accounts were launched and manage to have a group of followers 180 and 6 respectively.
- ❖ A meeting was scheduled the Department of Environment in the City of Chicago.
- ❖ A proposal and meeting with IIT Office of Campus Energy and Sustainability.
- ❖ A meeting with the local Plumbers Union 130.
- ❖ A working 3D model was created.
- ❖ An awareness video was filmed.

Future Work

- ❖ Future teams should continue our effort to persuade authoritative figures to publicize our vision.
- ❖ To push ahead for changes the to Chicago Plumbing code.
- ❖ Future IPROs should also aim to have a running model at IIT for a water saving system installed on campus.

Acknowledgments

